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Notes on Sanguinaria Canadensis.

Plate LXVII. of

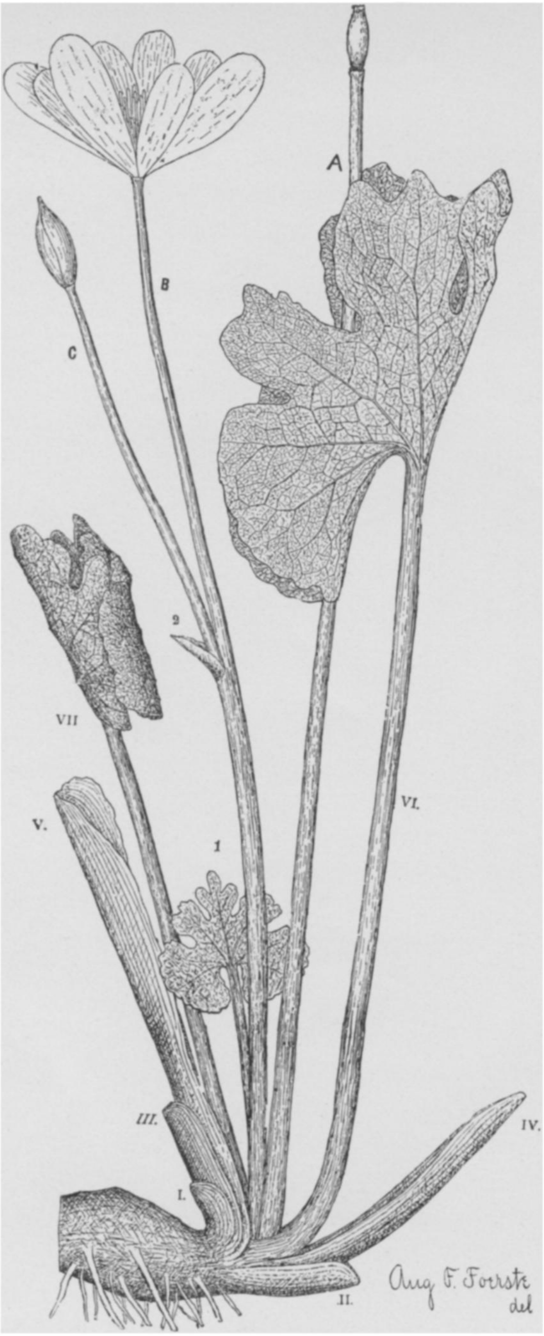
In 1884 I published a series of notes on the morphology of a few of our most common species. A part of those on the May apple I found soon after had already been published in an earlier number of the Botanical Gazette, by Prof. Thos. C. Porter. Among the notes then sent were a series on the blood-root. The drawings, however, were accidentally lost by the editor, and the notes returned to me at my request. The present drawings have been made from dried specimens, and this will account in part for their want of elegance.

The blood-root, *Sanguinaria Canadensis*, has a phyllotaxy of the ½ kind. Each year's growth begins with a few scales arranged on alternate sides of the stem; these are followed by a larger and then a smaller leaf, the rest of the axis being transformed into a flower, morphologically speaking. In the axis of the smaller leaf is found the bud which will continue next year's growth; in other words, sympodial growth occurs regularly (Fig. I).

Frequently the axis of the smaller leaf contains a second flower; this shows its nature as a transformed branch, by bearing at the base on one side a small leaf, which subtends the bud for next year's growth (Fig. II). Occasionally this secondary flower-stalk bears at its base even two leaves, the bud being then situated in the axil of the smaller leaf (Fig. III).

The flowering axis may bear a bract half way up to the flower, subtending a second flower-stalk. In this case the scale seems to be opposed to the smaller leaf beneath (Fig. IV). In the most complicated case known, the plant bears three flowers (Plate LXVII, Fig. V). One flower represents the terminal axis, another is in the axis of the smaller leaf. The second flower-stalk has at its base on one side a leaf subtending the leaf bud, and opposed to this, half way up the flowering stalk, is a bud subtending a third flower. At least six specimens showing this method of branching were found by Mr. W. B. Werthner and myself during the course of a day in the spring of 1884.

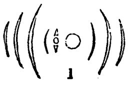
The sepals (2) may be more or less united on one side, in some cases complete cohesion taking place. There are also cases



Sanguinaria Canadensis.

in which two sets of sepals of two each are found; the lower set are then half an inch or less distant from the flower, and do not decussate, as might normally be expected. They form an angle of 45 degrees, or even much less, with the upper set.

Eichler, in his Blüthendiagramme, figures the plan of the flowers as though there were two whorls of petals of two petals each. By *dedoublement*, he derives from these two whorls of apparently four petals each. This compels him to locate the sepals *between* the petals of the outer whorl. Observation, however, will show that the sepals are not thus situated, but are beneath two of the petals of the outer whorl. If it be permitted to suggest another plan or arrangement, the following may, perhaps, be nearer the truth: The two sepals may be considered as decussating with two of the petals of the outer whorl; these decussate in turn with the remaining two petals of apparently the same whorl. The two sets of petals considered as a whole then decussate with the inner whorl of petals. This rather anomalous method of arrangement is considered in good taste in other plants, and perhaps will be of equal value here.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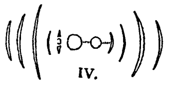
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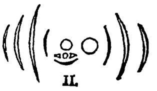
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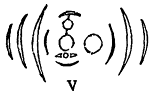
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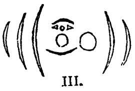
III.

EXPLANATION OF FIGURES.

All figures are represented as having four scales at the base of the plant; these with the bracts above are indicated in the diagrams by double crescentic lines—the leaves by single lines; leaves and bracts of the primary stem in the plate are designated consecutively by Roman numerals, those of the secondary stem by Arabic numerals. The stems are represented by circles, in the diagrams decreasing in size, in the plate lettered consecutively. The buds giving rise to the branch of next year are represented by minute circles between two minute triangles. Flowers borne in the axils of scales on the peduncles of other flowers, are connected with both by dotted lines.

AUGUST F. FOERSTE.

Notes on New Jersey Violets

Trenton, situated as it is near the borders of the "Yellow Drift," has a particularly rich and varied flora. Not only do we find here the flowers of the middle part of the State, but also a large proportion of those of both north and south Jersey. The genus *Viola* is well represented in this locality, nearly three-fourths of the species and varieties mentioned in Gray's Manual being found within five or six miles of Trenton. *Viola tricolor* is reported from this section, but I have been unable to find it, and have for several years been of the opinion that the var. *arvensis*, which grows here abundantly, must have been mistaken for it. Dr. Gray states in his Revision of N. A. Violets that the pansies are represented in America by *V. tricolor*, var. *arvensis* only, and that hitherto he has taken this for a field variety of *V. tricolor* escaped from cultivation. All my observations tend to confirm the opinion that the variety is indigenous.

I have occasionally found, in the fall, a few specimens of *V. palmata*, var. *cucullata*, Gray, in bloom; but last year, while botanizing near Ramsey's, Bergen County, N. J., I found the flowers quite plentiful, and a few days later was surprised to see the *V. canina*, var. *Muhlenbergii*, Gray, blooming so abundantly that in a short time I gathered a bouquet of the flowers as large as a teacup. The latter species continued to bloom from the time I found it in September to the middle of November. This fact is very interesting, since Dr. Gray says our plant is only spring flowering, and speaks of a summer form of *V. canina* found by Dr. Engelmann near Lake Superior. Whether this was owing to some peculiarity of the season, or whether it is of common occurrence at Ramsey's, I was unable to ascertain; but it is evident that under certain conditions some species of violets, naturally spring-flowering, bloom also freely in the fall; and it seems to me that this occurs frequently enough to warrant its being recorded in botanical works. WILLARD A. STOWELL.